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Examining secondary school students' perceptions of computer self-efficacy in terms of gender and class level variables

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Abstract

The aim of this study is to examine the computer self-efficacy perceptions of secondary students and examining of gender and grade. The study was designed with survey model and conducted with 302 students enrolled in secondary education. The data were collected via the "Self-Efficacy Perception Scale in relation to Computer" developed by Işıksal and Aşkar (2003). The data were analysed through standard deviation and mean value as well as independent t-test and One Way ANOVA for group comparison, besides to find which group causes the difference in the group comparison, a Post Hoc test was employed. At the results of study was found that secondary primary students' have high level self-efficacy perceptions related to computers. Additionally it was obtained that the self-efficacy perceptions about computer do not differ according to gender. Conversely it was found that there was a significant difference for grade.

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1. Introduction

Self-efficacy is one of the important variables of social learning theory. According to Bandura (1995), self-efficacy is the belief in one's capabilities to organize and successfully perform the activities required to show one's performance. In other words, self-efficacy belief is the individuals' belief of "I can do it" or "I can not do it" while performing a certain activity (Siegle, 2003). Students' self-efficacy beliefs, which affect their motivation and performance, need to be high (Cantürk-Günhan & Başer, 2007). That is because the individuals having high self-efficacy perception exert great effort to succeed in something, and when they come across adversities, they act insistently and patiently in order to overcome those adversities (Aşkar & Umay, 2001).

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When the related literature is examined, it is observed that self-efficacy, which is a concept that was developed in the field of social psychology, has been implemented in many fields and how it changes in terms of different variables has been researched (Aksu, 2008; Alabay, 2006; Duatepe-Paksu, 2008; Ekici, 2008; Üstüner, Demirtaş, Cömert, & Özer, 2009; Hacıömeroğlu & Taşkın, 2010; Seferoğlu & Akbıyık, 2005; Usluel & Seferoğlu, 2003). For instance, Compeau and Higgins (1995) set forth the perception of computer self-efficacy by implementing the self-efficacy concept into field of computers, and they defined it as the “judgment regarding the individual’s skill of using computers”. In addition, many studies focused on the relationship between self-efficacy with respect to using computers and a variety of computer behaviors (Hill, Smith, & Mann, 1987; Webster & Martocchio, 1992; 1993).

The studies conducted on computer self-efficacy perception show that the individuals with high computer self-efficacy are more willing to participate in computer related activities (Usluel & Seferoğlu, 2003). Furthermore, the individuals having high perception of computer self-efficacy resist to technological developments less and adapt to technological developments more quickly than the individuals having low perception of computer self-efficacy. An important aspect of computer self-efficacy is that it affects individuals’ interests, their use of computers and their interaction with computers (Gürçan, 2005). Educational institutions, which take the responsibility of raising individuals that fit the human profile required by the society, are expected to raise individuals that can reach information, use technology and learn on their own (Akkoyunlu & Kurbanoglu, 2003). It is aimed to make education widespread and increase its quality in our country as the period of study was changed into 4+4+4. For that purpose, information technology classrooms were established in at least two schools in every province and district (Milli Eğitim bakanlığı [MEB], 2008). It is stated that eleven millions of these students are computer and internet users. To raise individuals with this quality lays serious responsibilities on the educational institutions. Therefore, it has become necessary for the educational institutions to arrange the learning environments of the students in accordance with existing conditions. In this regard, to determine secondary school students’ computer self-efficacy holds importance since it contributes in determining whether or not the educational institutions succeed in fulfilling the responsibility that they took.

When the studies conducted on computer self-efficacy were examined, it was observed that the majority of these studies focused on prospective teachers (Akkoyunlu & Kurbanoglu, 2003; Aşkar & Umay, 2001; Gürçan, 2005; Özden, Aktay, Yılmaz, & Özdemir, 2007), and then, the studies on teachers were conducted (Akkoyunlu & Kurbanoglu, 2004; Seferoğlu & Akbıyık, 2005). However, not many studies on students were encountered (Ekici & Uzun, 2008; Işıksal & Aşkar, 2003). Thus, to determine secondary school students’ computer self-efficacy will be significant for taking the necessary precautions for the students of lower educational levels before they enroll higher education institutions.

1.1. Purpose

The aim of this study is to determine 5th, 6th, 7th, and 8th grade students’ perceptions of computer self-efficacy and to examine these perceptions in terms of gender and class level variables.

2. Method

2.1 Research Model

This research was conducted using the survey model. Survey model is to try to describe a previous or existing situation the way that it is or it was (Karasar, 2011). Thus, it was considered appropriate to use the survey model in determining secondary school students’ perceptions of computer self-efficacy in terms of gender and class level variables.

2.2 Sample

The study sample consists of 302 students who study in a secondary school located in a province of South Eastern Anatolia Region in the 2012-2013 academic years.

3. Data Collection Tool

3.1 Computer Self-Efficacy Scale

Computer Self-Efficacy Scale, which was developed by Işıksal and Aşkar (2003), was used in the study in order to determine secondary school students' perceptions of computer self-efficacy. The scale is of 5-point Likert type and contains 10 items. The scale is composed of two dimensions, namely as general information on computers and special computer skills. Cronbach's alpha value was calculated as 0.86 for the overall scale. Cronbach's alpha reliability coefficient, which was calculated for the reliability of measurements, was found as 0.86 in this study.

4. Data Analysis

The items in the computer self-efficacy scale were graded from 5 to 1 ranging from "Completely Agree" category to "Completely Disagree" category. The lowest possible score is 10 and the highest possible score is 50 in the scale. If the score obtained in the perception scale ranges from 10 to 18, it corresponds to "Completely Disagree" category; it corresponds to "Disagree" category if the score ranges from 19 to 26; it corresponds to "Undecided" category if the score ranges from 27 to 33; it corresponds to "Agree" category if the score ranges from 34 to 42; and it corresponds to "Completely Agree" category if the score ranges from 43 to 50. SPSS 16.0 program was used in analysing the obtained data. Arithmetic mean and standard deviations were calculated in terms of variables and they were analysed using t-test, one-way analysis of variance and LSD test.

5. Findings

The data obtained in the study, which was conducted in order to examine the level of secondary school students' perceptions of computer self-efficacy and whether or not there was a difference among their perceptions of computer self-efficacy in terms of gender and class variables, was presented as tables. The equality of variances belonging to the designated groups were tested with Levene's test, and it was presented that the variances were homogeneous.

Table 1

Distribution of Secondary School Students' Perception Scores on Computer Self-Efficacy

	N	Min	Max	Mean	sd
<i>Perception Scores on Computer Self-Efficacy</i>	302	11	50	39.77	6.77

As seen in Table 1, students' average perception score on computer self-efficacy is 39.77. Standard deviation is 6.77. The highest perception score is 50 whereas the lowest perception score is 11. Students' perception of computer self-efficacy is at a "good" level ($\bar{x}=39.77$). In view of these values, secondary school students' perceptions of computer self-efficacy correspond to "Agree" category. This finding shows that the secondary school students' perceptions of computer self-efficacy are positive and they are self-confident. Independent t-test was conducted on the scores obtained from the scale in order to determine whether or not secondary school students' average perception scores on computer self-efficacy differed in terms of gender. The results were given in Table 2.

Table 2*Independent t-Test Results of Students' Perception Scores on Computer Self-Efficacy in Terms of Gender*

Variable	Gender	N	\bar{x}	sd	df	t	p
Perception Scores on Computer Self-Efficacy	Female	142	39.54	7.09	300	1.27	.563
	Male	160	39.99	6.48			

As seen in Table 2, average perception scores of female students and male students on computer self-efficacy are 39.54 and 39.99 respectively. In the conducted t-test, it was observed that the perception scores of male students on computer self-efficacy were a little higher than those of female students. However, no significant difference was found between scores of female students and male students on computer self-efficacy [$t_{(300)}=1.27, p>.05$].

This finding shows that secondary school students' perceptions of computer self-efficacy did not change in terms of gender. The data obtained from secondary school students' computer self-efficacy scale was analysed in terms of their class levels. The results were given in Table 3.

Table 3*Distribution of Students' Perception Scores on Computer Self-Efficacy in Terms of Their Class Levels*

Variable	Grades	N	\bar{x}	sd	Std. error of Mean	Min.	Max.
Perception Scores on Computer Self-Efficacy	5 th grade	97	39.09	6.81	.692	14	50
	6 th grade	77	38.58	7.55	.861	11	50
	7 th grade	67	41.88	6.14	.750	26	50
	8 th grade	61	40.05	5.88	.753	27	50
	Total	302	40.98	6.44	.465	17	50

Levene Test $F= .672, sd= 298, p=.570$

Whether or not the average differences among students' perception scores on computer self-efficacy were significant were analysed with One-Way analysis of variance. The results are given in Table 4. It was observed that there was a significant difference among computer self-efficacy perception scores of the groups that were formed in accordance with class levels ($F_{(3-298)}=3.391, p<.01$).

Table 4*ANOVA Results Regarding the Significance of the Difference Among Students' Perception Scores on Computer Self-Efficacy in Terms of Class Levels*

	Average	Sum of Squares	df	Mean Square	F	Sig.
The average of Perception Scores on Computer Self-Efficacy	Between Groups	455.925	3	151.975	3.391*	.018
	Within Groups	1335.763	298	44.815		
	Total	1381.689	301			

* $p<.01$

LSD test was conducted in order to find the source of this difference. According to LSD test, it was observed that there is a significant difference in favor of 7th grade students in their average perception scores on computer self-efficacy when compared to 5th and 6th grade students. However, no significant difference was observed between 8th grade students and 5th, 6th and 7th grade students (Table 5).

Table.5

Tukey HSD Results Regarding the Significance of the Difference Among Students' Perception Scores on Computer Self-Efficacy in Terms of Class Levels

Grade I	Grade J	Mean Difference (I-J)	Std. Error	Sig.
5 th grade	6 th grade	.508	1.022	.619
	7 th grade	-2.788*	1.063	.009
	8 th grade	-.956	1.094	.383
6 th grade	5 th grade	-.508	1.022	.619
	7 th grade	-3.296*	1.118	.003
	8 th grade	-1.465	1.147	.203
7 th grade	5 th grade	2.788*	1.063	.009
	6 th grade	3.296*	1.118	.003
	8 th grade	1.831	1.185	.123
8 th grade	5 th grade	.956	1.094	.383
	6 th grade	1.465	1.147	.203
	7 th grade	-1.831	1.185	.123

* The mean difference is significant at the 0.05 level.

6. Conclusion and Discussion

In this study, it was determined that secondary school students' perceptions of computer self-efficacy were at a "good" level. This condition signifies that the students consider themselves adequate in terms of computers. It can be stated the fact that the Ministry of National Education established computer laboratories in schools was effective in the emergence of this result. However, in their study, Ekici and Uzun (2008) argue that the students' perception scores on computer self-efficacy are at a "medium" level and that they do not have self-efficacy in using computers. The results obtained in the study do not show parallelism with the result of the study of Ekici and Uzun. In view of the study, it was observed that the perception scores of male students on computer self-efficacy were a little higher than those of female students. However, no significant difference was found between students' perception scores on computer self-efficacy and their genders. This result of the study shows parallelism with the results obtained by (Özden et al., 2007; Seferoğlu, 2005; Torkzadeh, Pflughoeft, & Hall, 1999) in their studies. Apart from this, in some researches, it was found that there was a significant difference in favor of male students among computer self-efficacy of female students and male students (Ekici & Uzun, 2008; Işıksal & Aşkar, 2003; Miura, 1987). In his meta-analysis study, Whitley (1997) examined 82 studies. In his study, he states that male students are more adequate than female students in computer technologies. The results of that study contradict with the result of this study. This condition can be explained as the fact that gender is not an effective factor on perceptions of computer self-efficacy. Another results obtained from the study is that there is a significant difference among secondary school students' perception scores on computer self-efficacy in terms of their class levels. This result coincides with the result obtained from the study of Ekici and Uzun (2008). Similarly, Torkzadeh, Pflughoeft, and Hall (1999) stated that students' beliefs of computer self-efficacy increase during their education. Therefore, contribution must be made for the improvement of low-level students' computer self-efficacy by organizing computer activities also in other disciplines of elementary programs apart from computer courses in computer laboratories.

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